The Lady Fern, Athyrium filix-femina, in Saskatchewan

VERNON L. HARMS*

Several years ago, Harms (1978) reported the first Saskatchewan records of the Lady Fern, *Athyrium filix-femina* (L.) Roth, from the Wollaston Lake–Reindeer Lake region in the northeastern part of the province. These collections partially filled in an apparent mid-continental distribution gap of over 1300 km from central Manitoba to westernmost Alberta, between the known eastern and western ranges of *A. filix-femina* s.lat. in northern North America (*Figs. 1*, D and *2*).

During the last several years, 13 additional collections (with duplicates, including 84 individual plants) of *A. filix-femina* have been made from five widely separated regions of Saskatchewan, plus one collection from northeastern Alberta. These greatly expand the known range of the species in the province and in west-central Canada (*Figs. 1* and *2*). The six general regions (and in parentheses the more specific localities within each) for collections of the Lady Fern in Saskatchewan now include the following: (1) Wollaston Lake–Reindeer Lake (Hidden Bay of Wollaston Lake, Geikie River, Courtenay Lake, and W of Numabin Bay of Reindeer Lake; previously reported in Harms, 1978); (2) Cypress Hills (Boiler Creek north of Loch Leven); (3) Clearwater River (Smoothrock Falls and Descharme River); (4) Lake Athabasca south shore (Cantara Bay and MacFarlane River); (5) Wapawekka Hills (north slope above and below abandoned military site); and (6) the Pasquia Hills (S. Fork White Poplar Creek and N. Fork Stony Creek). The above regions are indicated by letter-symbols on the Saskatchewan distribution map (*Fig. 1*), and the actual collection sites by dots (to the extent the sites are far enough apart to be distinguishable as separate dots at the scale of the base map). The new collections are those of the author with Robert A. Wright et al., except for the Cypress Hills collection, which was made by W. C. Harris and S. M. Lamont. The single collection from northeastern Alberta was from along the Clearwater River 24 km west of the Saskatchewan border (15 June 1979, *Wright s. n.*), and essentially fits into our general Clearwater River region (*Fig. 1*, B). Vouchers of all collections are deposited in The W. P. Fraser Herbarium (SASK). Complete collecting data for these is available upon request from the Herbarium or the author.

The local abundance of *A. filix-femina* at most Saskatchewan sites was surprising, considering that the species had not previously been reported from the province. Our floristic studies in the Pasquia Hills and Wapawekka Hills revealed this to be one of the more frequent ferns at higher elevations, third in abundance only to *Matteuccia struthiopteris* (L.) Todaro and *Dryopteris spinulosa* (O. F. Muell.) Watt. Lady Ferns appear to have been overlooked previously in Saskatchewan, possibly mistaken in the field for the Spinulose Shield Fern, *D. spinulosa*, to which at least the western forms bear a cursory resemblance. But even vegetatively, Lady Ferns may be distinguished from the latter by their veinlets extending to tips of the pinnule teeth and their teeth tips not being truly spinulose. In the Pasquia and Wapawekka Hills, *D. spinulosa* tended to be rather more characteristic of upland coniferous woods, in contrast to

*The W. P. Fraser Herbarium, University of Saskatchewan, Saskatoon, Sask. S7N 0W0, Canada.

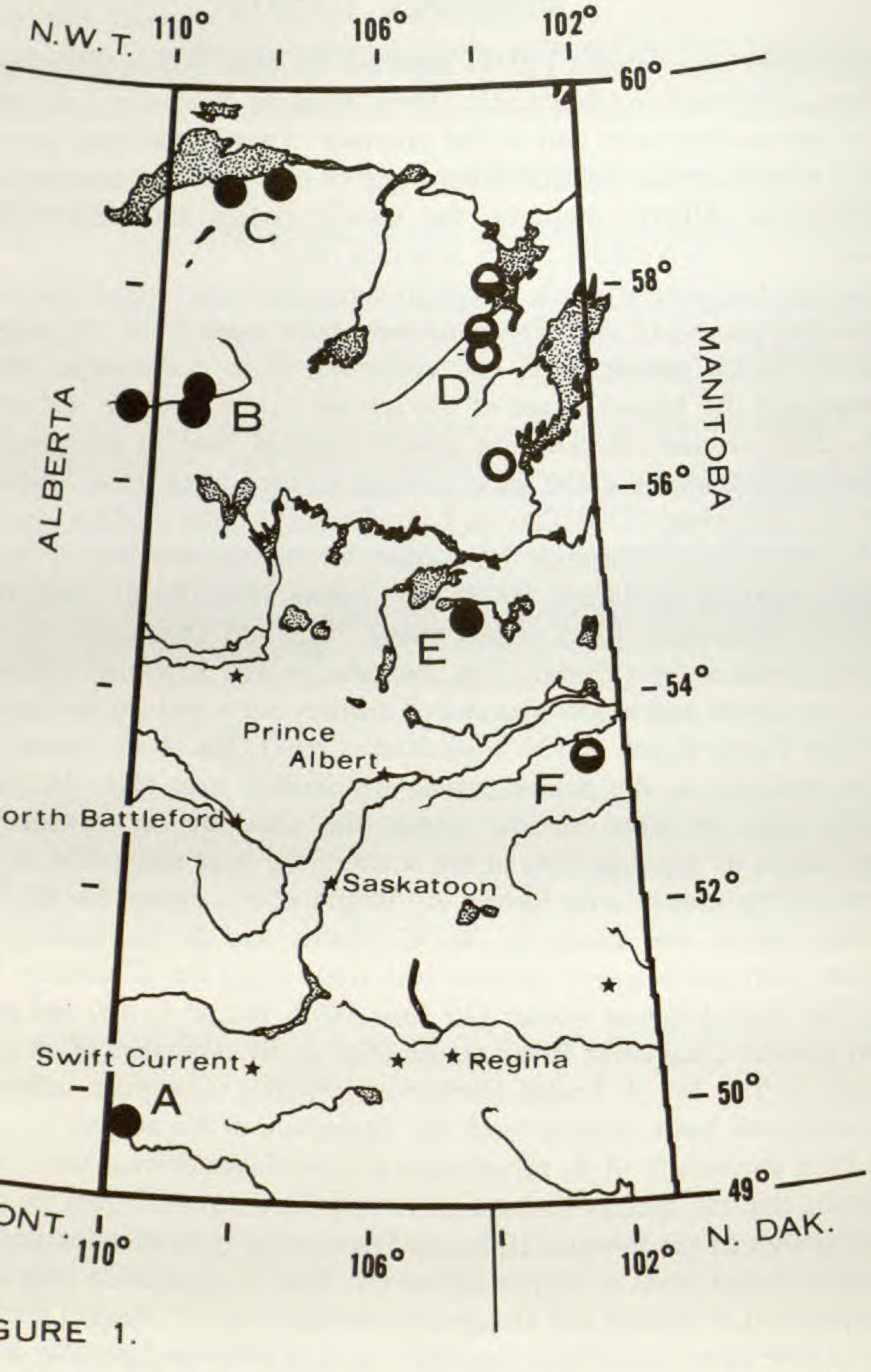

FIGURE 1.

FIG. 1. Map of Saskatchewan, Canada, showing localities for populations of *A. filix-femina* var. *sitchense* (closed circles), of var. *michauxii* (open circles), and of those with intermediates as well as var. *sitchense* (half-open circles). Symbols for the regions are: A = Cypress Hills Provincial Park, B = Clearwater River, C = South shore of Lake Athabasca, D = Reindeer Lake–Wollaston Lake, E = Wapawekka Hills, and F = Pasquia Hills.

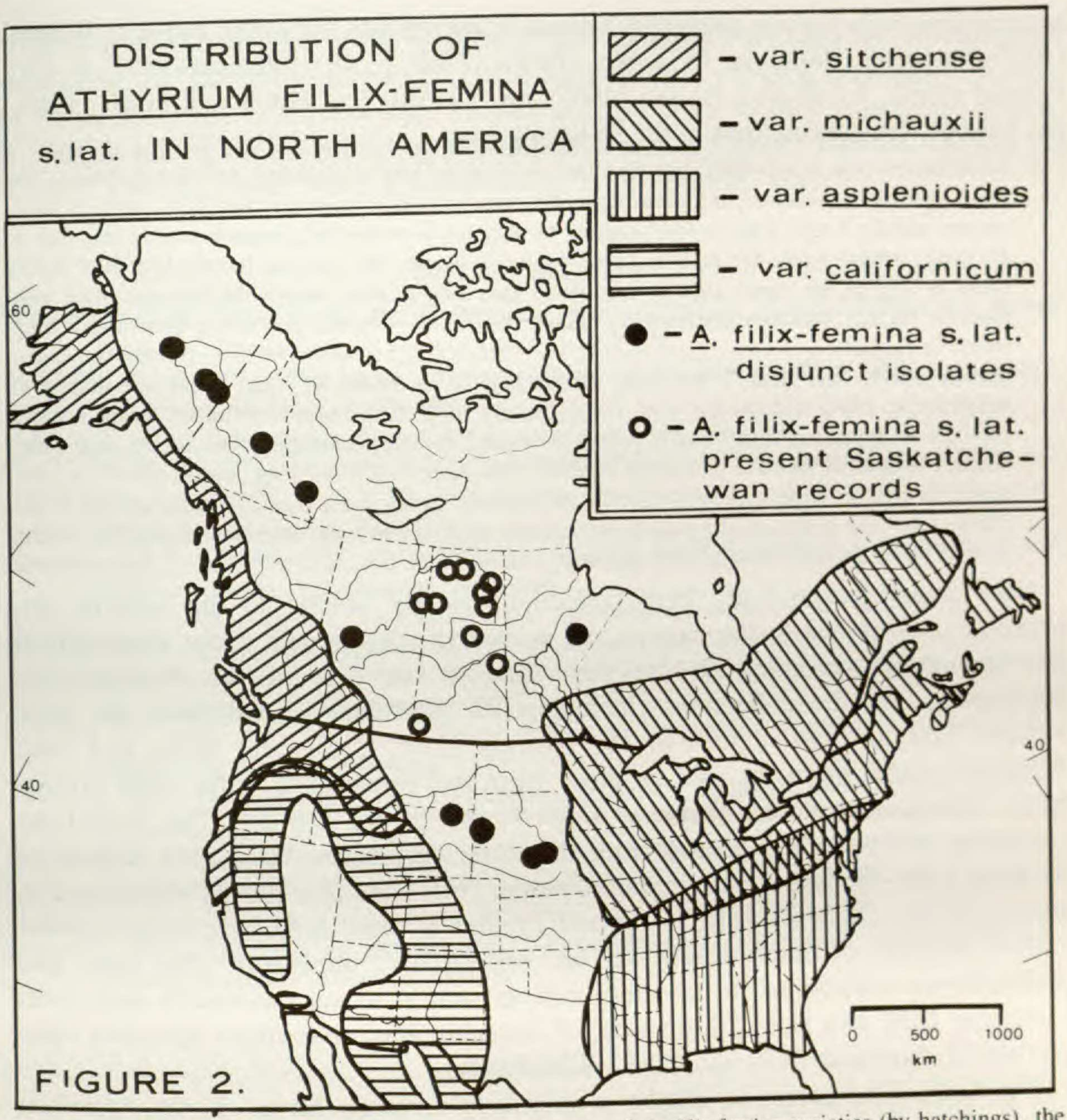

FIG. 2. Map of North America showing the main ranges of *A. filix-femina* varieties (by hatchings), the location of previously reported disjunct isolates (by closed circles), and the presently reported Saskatchewan collections (by open circles), indicating the geographical relationship of the new records to the former. Based mainly on Hultén (1964, pp. 178–179, 1968, p. 48), but supplemented by information from McGregor et al. (1977, p. 5), Scoggan (1957, p. 63, 1978, pp. 155–156), Boivin (1967, pp. 29–30), Gleason and Cronquist (1963, p. 17), and Hitchcock et al. (1969, pp. 63–64).

the usual Lady Fern habitat here and elsewhere in the province of moist, mixed-wooded or shrub-thicketed to more or less open stream sides, lake shores, and seepage areas.

The Saskatchewan specimens of *A. filix-femina* are especially interesting because they occur in the mid-continental distributional gap between the northeastern North American var. *michauxii* (Spreng.) Farw. [syn. subsp. *angustum* (Presl) Hultén] and the western var. *sitchense* Rupr. [syn. var. *cyclosorum* Rupr. and subsp. *cyclosorum* (Rupr.) C. Chr.] (*Fig. 2*). The distinguishing characteristics between these varieties,

as compiled from various published keys and descriptions including those of Butters (1917), Scoggan (1978, pp. 155–156), Hultén (1968, p. 48), Gleason (1952, p. 43), Fernald (1950, p. 40–41), Boivin (1967, pp. 29–30), and Hitchcock et al. (1969, pp. 63–64), are summarized in the following key:

1. Indusia more than 1 mm long, less than half as broad as long, straightish or crescent-shaped, not crossing the vein, short-ciliate; spores light brownish, smooth to sparingly papillate; pinnules more narrow, mostly 5 mm wide or less, slightly to only medium-toothed; laminae mostly less than 6 dm long, widest below the middle; stipes relatively longer, the laminae mostly less than 2(2.5) times as long as the stipes; stipe base scales 7 mm long or less, mostly dark-brown, often with blackish streaks; rhizomes horizontal to oblique-ascending, with the new frond growth appearing lateral to the tuft.....var. *michauxii*

1. Indusia mostly less than 1 mm long, about half to as broad as long, horseshoe-shaped to suborbicular, often crossing the vein, conspicuously long-ciliate; spores yellowish, more densely papillate to appearing finely warty; pinnules broader, the best-developed ones over 5 mm wide, strongly toothed or lobed to pinnatifid; laminae often more than 6 dm long, widest at or somewhat above the middle; stipes relatively shorter, the laminae mostly more than 2.5 times as long as the stipes; stipe base scales usually pale brown, mostly over 10 mm long; rhizomes strongly ascending to erect, with the new frond growth appearing central in the tuft.....var. *sitchense*

Most Saskatchewan Lady Fern collections clearly belong to the western var. *sitchense*, rather than to the eastern var. *michauxii*, despite the wider geographical gap apparently remaining to the west than to the east of the Saskatchewan populations. All the collections (including 70 individual plants) from the more western Saskatchewan regions of the Cypress Hills, Clearwater River and Lake Athabasca south shore, as well as those from the Wapawekka Hills, were consistently identifiable as var. *sitchense* (*Fig. 1*, A, B, C, and E). The collections (including 24 individual plants) from the more eastern Saskatchewan regions of Reindeer Lake–Wollaston Lake and the Pasquia Hills were also mostly determined as nearest to var. *sitchense* (*Fig. 1*, D and F), but at least some specimens showed various degrees of intermediacy to the eastern var. *michauxii*. The only two Saskatchewan collections to be determined as nearest to var. *michauxii* were from Courtenay Lake and from 20 km west of Numabin Bay of southern Reindeer Lake (*Ternier & Jasieniuk 1420* and *2113*, respectively).

The Lady Fern seems to display a relatively common boreal North American distributional pattern, with major eastern and western ranges of relatively high plant frequency, but an intervening central region where the plants are less common to rare and sporadic, or even absent. Our recent findings of *A. filix-femina* at widely spaced localities across Saskatchewan suggest it should be looked for as well across central and eastern Alberta and in western Manitoba. The formerly apparent mid-continental gap for the species, from western Alberta to central Manitoba, may actually be nonexistent. It is interesting that farther south across the Great Plains a similar series of "stepping stones" seems to be formed by disjunct isolates in north-central Nebraska, the Black Hills in southwestern South Dakota, and Sheridan County in northeastern Wyoming (*Fig. 2*). Most likely all of these apparently disjunct isolated populations represent relicts of a formerly continuous west–east distribution.

The author expresses his sincere appreciation to Wayne C. Harris and Sheila M. Lamont for their valuable contribution to this paper in first discovering and

collecting *A. filix-femina* in the Cypress Hills Provincial Park, and for subsequently measuring the varietally diagnostic characteristics on a standing population sample of 21 plants at the collection site. Thanks are also given to field associates, Robert A. Wright (along on all collecting expeditions), and to John H. Hudson, Donald F. Hooper, and Les Baker (each accompanying us on one field trip).

LITERATURE CITED

BOIVIN, B. 1967. Flora of the Prairie Provinces. Part I—Pteroids, Ferns, Conifers, and Woody Dicopsids. Provancheria, Université Laval, Quebec City.

BUTTERS, F. K. 1917. The genus Athyrium and the North American ferns allied to Athyrium filix-femina. Rhodora 19:170–207.

FERNALD, M. L. 1950. Gray's Manual, 8th ed. American Book, New York.

GLEASON, H. A. 1952. The New Britton and Brown Flora of the Northeastern United States and Adjacent Canada. Vol. 1–The Pteridophyta, Gymnospermae, and Monocotyledoneae. New York Botanical Garden, New York.

———, and A. CRONQUIST. 1963. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. Van Nostrand, New York.

HARMS, V. L. 1978. Athyrium filix-femina new to Saskatchewan. Amer. Fern J. 68:119–120.

HITCHCOCK, C. L., A. CRONQUIST, M. OWNBEY, and J. W. THOMPSON. 1969. Vascular Plants of the Pacific Northwest. Part I–Vascular Cryptogams, Gymnosperms, and Monocots. University of Washington Press, Seattle.

HULTÉN, E. 1964. The Circumpolar Plants. I–Vascular Cryptogams, Conifers, Monocotyledons. Almqvist & Wiksell, Stockholm.

———. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, California.

McGREGOR, R. L., R. M. BARKLEY, et al. 1977. Atlas of the Flora of the Great Plains. Iowa State University Press, Ames.

SCOGGAN, H. J. 1957. Flora of Manitoba. Bull. Natl. Mus. Canada. Ottawa, 140:i–v, 1–619.

———. 1978. The Flora of Canada. Part 2–Pteridophyta, Gymnospermae, Monocotyledoneae. National Museums of Canada, Ottawa.

REVIEW

HYBRIDS IN EUROPEAN ASPLENIACEAE (PTERIDOPHYTA), by T. Reichstein, Botanica Helevtica 91:89–139. 1981.—Two-thirds of the more than 30 species of European Aspleniaceae are as fully promiscuous as those of the Appalachian Asplenium complex in America, and the number of hybrids they produce is even greater. The species and their hybrids have been studied intensively since the 1950's, principally by Bouharmont, Lovis, Meyer, Reichstein, Sleep, and Vida. The present paper summarizes the accumulated knowledge of past research and presents it in the form of annotated checklists of the species and of the hydrids. Several new hybrids and new cytological results are described in two appendices, and many hybrids are illustrated with line drawings. Extensive introductory material is applicable to fern hybridization in general, as well as to European *Asplenium—D.B.L.*